THE
OPTICAL
MAGIC
LANTERN
JOURNAL
AND
PHOTOGRAPHIC
ENLARGER.
EDITED BY J. HAY TAYLOR.
A MAGAZINE OF POPULAR SCIENCE FOR THE LECTURE-ROOM AND THE DOMESTIC CIRCLE.
Entered at Stationers' Hall
1889.

Vol. 7.—No. 90. NOVEMBER, 1896. DOUBLE NUMBER. *Price* 2d., *Post-free* 3½d.

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NOTICES.

THE *Optical Magic Lantern Journal and Photographic Enlarger* is issued on the 1st of every month, price One Penny, and may be obtained from all Newsvendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free:—

		United States.
12 months, including double numbers	2/6	75 cents.
Single copies	2½d.	8 ,,

EXCHANGE Column, General Wants, &c. (not Trade)—First 20 words, 6d.; and for every 3 additional words, 1d.

SMALL ADVERTISEMENTS must reach the office not later than the first post on the 24th of each month. All cheques and postal orders to be made payable to the Magic Lantern Journal Company, Limited.

EDITORIAL communications must be addressed, **J. HAY TAYLOR.** Advertisements and business communications to the **Magic Lantern Journal Company, Limited, 9, Carthusian Street, London, E.C.**

American Agents:—The International News Co., 83 and 85, Duane Street, New York City.

NOTES.

Eastman Company at Berlin.—The Eastman Photographic Materials Company, Limited, has just opened a branch office at 91, Markgrafen Strasse, Berlin.

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Photographic Exhibition at Manchester.—The annual exhibition of the Manchester Amateur Photographic Society will be held on the 10th, 11th, 12th, 13th, and 14th inst.

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Burrelton Lantern Lecture.—The Rev. James A. Graham, M.A., missionary, Kalimpong, gave a lecture in the Burrelton school on the 3rd ulto. A series of about 150 magic lantern views of scenes in Northern India, native types, and other objects of interest were displayed on the screen, and lucidly described in turn. The Rev. W. A. Campbell, of Cargill, presided, and there was a very large attendance.

◆ ◆ ◆

Animated Photographs at Brechin.—Animated photographs were given in Brechin on the 2nd ulto. by Mr. David Devant, of the Egyptian Hall, London. Several very clever conjuring and entertaining musical sketches were included by Mr. Douglas Beaufort. The programme was varied and full of amusement, affording an excellent opportunity for the display of his remarkable ability and skill as a ventriloquist, and also for his marvellous sleight-of-hand performances. The cinematoscope was admirably manipulated by Mr. C. W. Locke, whose name is well-known to our readers. Mr. Locke is also booked to operate animated photographs at Aberdeen, Peterhead, Montrose, Inverness, Macduff, Elgin, and other places.

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Lantern Service at Rattray.—The popularity of the optical lantern as an educative force is now generally admitted, but if it were necessary the crowded attendance at the Wesleyan Methodist Church on Sunday evening at the opening of the lantern services was an additional proof that there were many who approved of being taught by the eye as well as the ear. Rev. D. C. Ingram took as his subject—"The World's Greatest Wonder," and held the attention of his audience during the service. Mr. F. Russell manipulated the lantern.

◆ ◆ ◆

Limelight and the Gospel at Dundee.—Last month Mr. T. M. Platt, of Glasgow, gave a series of lectures of an evangelical nature at Dundee, using the lantern for illustrations connected with the subject. Great interest was taken in the proceedings which were rendered very popular by reason of the good illustrations used. The lantern was ably manipulated by Mr. Scrimgeour, whose practical articles from time to time find a place in the columns of this journal.

◆ ◆ ◆

Cylinder Explosion — Club Reported Wrecked.—For some weeks past a report has been going the rounds that a portion of the premises of the Camera Club in Charing Cross Road had been wrecked by the explosion of a cylinder of compressed oxygen, and as no particulars respecting this were forthcoming, a further report got afloat that the management had decided to keep the matter from the public and that all concerned had been pledged to secrecy, etc. The whole affair seems to have been a repetition of the story of the "three black crows." Several structural alterations had been going on at the club premises, and when one or two members looked in at the dining room whilst the workmen were engaged in pulling down a lath and plaster partition, one member remarked that it reminded him of the general appearance that a room might have had a cylinder of compressed gas exploded in it. When speaking of how the alterations were getting on, this was repeated to a non-member, and after a few repeatings it was said that the damage to the walls in question *was* caused by the explosion of a cylinder. So the story grew, and it is quite possible that by this time the report may have grown to include the deaths of several of the members by the explosion. As a matter of fact, in the club's lantern the electric light is used, and it is some considerable time since they had cylinders of gas on their premises.

◆ ◆ ◆

Acetylene Gas at New Zealand.—Mr. D. R. Eunson, of Mornington, has been the first person in his part of the country to give a public demonstration of acetylene gas. On August 8th he explained its uses and gave practical demonstrations at the City and Suburban Tramways Company's offices with a small apparatus constructed by himself. He connected a gasalier with two service pipes, one house gas and the other acetylene, and showed the relative intensity between these two gases, and also an admixture of the two by the manipulation of the two taps. Great enthusiasm prevailed at the demonstration, and it is likely that acetylene will shortly be applied in New Zealand for practical purposes.

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Mr. F. Brown's New Address.—Mr. F. Brown, who within the past two years has been extending his workshops in consequence of increased business, finding that it was impossible to further enlarge them at Ossulston Street, N.W., has given the task up and moved into more commodious premises at 13, Gate Street, Queen Street, W.C., where he has much greater facilities for the manufacture of the Gridiron saturator, Stedman's automatic oxygen generator, jets, and numerous limelight and other appurtenances.

◆ ◆ ◆

The Lantern at Forfar.—On the 17th ult. the juvenile lodge of I.O.G.T. enjoyed a pleasant evening with the lantern, the subjects being "The Lifeboat," "Billy's Rose," "Road to Heaven," together with a number of local views. This, together with a few songs and recitations enabled a most enjoyable evening to be spent.

◆ ◆ ◆

Stereoscopic Views.—Mr. H. Cornthwaite, of the Imperial Arcade, Birmingham, is supplying stereoscopic views at prices, according to subject and quality, to suit all pockets, viz., from 8s. 6d. to 48s. per dozen.

P. S. & R.—Messrs. Perken, Son & Rayment advise us that their lease of the premises of their Oxford Street Branch having lapsed by effluxion of time, all business will be transacted from their head-quarters, 99, Hatton Garden, Holborn Viaduct, E.C.

◆ ◆ ◆

Political Lectures.—Messrs. Nettleship & Rose, lantern specialists, of 61, Highbury Quadrant, having made a great success of their lecture, "The Independents, and what they have done for England," which is still running, are busy preparing a lecture on "The Battle of the Schools." This firm's lectures are accompanied by good lantern slides.

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A Hint to our Advertisers.—Mr. Pettigrew, of Melbourne, Australia, suggests that all advertisers in the MAGIC LANTERN JOURNAL, should add the prices of what they advertise therein, and adds, "Readers of your journal in Australia often see an article advertised therein, which is likely to suit their requirements, but in many instances no price is stated in the advertisement, and we first have to write to England for the price, and then write again ordering the goods with the money. All this takes time—generally five months—which could be altered if the advertisers would in the first instance quote the prices in their advertisements."

◆ ◆ ◆

Stanley Show—Photographic Competitions.—In conjunction with the Stanley Cycle Show to be held at the Royal Agricultural Hall, London, from 21st to 28th inst., a photographic competition will be held, it being the intention to award gold, silver, and bronze medals, seventeen in all. Full particulars and entry forms can be obtained from Mr. Walter D. Welford, 57 and 58, Chancery Lane, W.C.

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Old Photographs and Appliances.—One of the features of the late exhibition of the Lewisham Camera Club was an exhibit by Mr. A. L. Henderson, who before retiring was a prominent London photographer. He attended and explained the various articles shown (to an admiring audience)—these consisted of vitrified enamels, Daguerrotypes dated from 1851, glass positives by various processes which retained quite a brilliant appearance, old water lenses, plate coating machine, a camera made in 1840, with uncorrected lens and scale for adjustment, pantoscopic camera, a camera turn table made in 1854, Stebbing's roll holder camera of 1866, balloon camera used in French war, and a variety of other interesting apparatus. As we learned that this was only a small portion of the old apparatus in his possession, one can form the opinion that Mr. Henderson possesses a fine museum of photographic apparatus of by-gone days.

◆ ◆ ◆

Photique Art.—It may not be generally known that the set of "Ben Hur" slides published by Messrs. Riley Bros., and which have become vastly popular, partly by reason of the recent law case reported in our last journal, is the work of Mr. F. F. Weeks from living Jewish models. Mr. Weeks has erected studios at 263, Cannhall Road, Leytonstone, where, having a large stock of costumes, models, scenes, etc., he is prepared to make pictorial representations suited for any subject. We have known Mr. Weeks in connection with business for several years, and can say he is a thorough artist.

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Photographic Exhibition at Hackney.—On 17th, 18th, 19th, and 20th inst., the annual exhibition of the Hackney Photographic Society will be held at Morley Hall, Hackney. Entry forms and particulars may be obtained from Mr. W. Fenton-Jones, 12, King Edward Street, Hackney, N.E.

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Wrench's Cinematograph.—We learn that a number of these instruments are now in use in the provinces, and that the exhibitors are making good financial headway.

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Acetylene Explosion in Paris.—On the afternoon of the 17th ult., a disastrous explosion occurred at the acetylene compressing works of M. Raoul Pictet, in the Rue Championnet, Paris. It appears that several supposed-to-be-empty cylinders which had been returned to be filled with acetylene, compressed to liquefaction, were being handled, when one, which had been returned without being first emptied, exploded with great force, killing two men and wrecking the premises. It is surmised that the workman believing the cylinder to be empty, unscrewed the valve in close proximity to a light. All users of acetylene gas in Paris must notify the police under pain of a penalty.

◆ ◆ ◆

Hill—Kœnig.—At Emmanuel Church, Maida Vale (August 26th), marriage was celebrated between Henry James Hill and Florence Kœnig. The respected fathers of the bride and bridegroom are Prof. Kœnig, of Edgware-road, W., one of our greatest authorities in lanterns and their manipulation, and Mr. W. R. Hill, our old artist, who first made his reputation in the days of the old Polytechnic. Congratulations all round.

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Chandler's Camera Concert.—On 20th ult., at the Restaurant Frascati, under the auspices of the *elite* of the cycling world, Mr. H. P. Chandler gave an excellent smoking concert, assisted by a number of professional vocalists and instrumentalists. During the evening Mr. Chandler, who shines as a lantern exhibitor, as well as a cyclist, projected about 200 slides illustrative of "Lights and shades of cycling life," "Up the river in a steam launch," and a set of artistic pictures especially intended for the ladies. Everything at the lantern went briskly, the descriptions were short but graphic, and Mr. Chandler was voted a jolly good fellow.

◆ ◆ ◆

"Shakespeare's Town and Times."—It may be of interest to our readers to know that Her Majesty the Queen has been pleased to accept a copy of "Shakespeare's Town and Times," which publication, from the pens of Mr. and Mrs. Snowden Ward, we commented on in our issue for September.

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Ceylon on the Screen.—On the 7th ulto., Captain W. Morrison, of the Army Medical Staff, gave an interesting lecture before the Edinburgh Photographic Society on "Ceylon, its Scenery, Temples, and Industries." The lantern illustrations were greatly admired.

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"A Nicht wi' Burns."—The editor of the *People's Friend* lent his admirable set of slides, illustrative of the above, last month to the Good Templars' Lodge at Monifieth, and in consequence quite an impetus has been given to lantern work in this district.

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Home Scenes.—It is surprising how often one will see a thing without perceiving, and with what zest amateur photographers will take journeys of several miles away from home, when all the time excellent subjects and picturesque bits are to be found practically at their doors. Mr. R. Ralph, a well-known London solicitor, takes great delight in giving free lantern exhibitions to the poor children in the south-west of London, and lately prepared a number of slides from subjects with which they should be familiar. Amongst them was one of the well-known miniature waterfalls at Battersea Park. When this was projected on the screen he said: "Now boys, you will all know where this is, for it is practically in your own playground." He expected everyone to call out the name, but, instead, there was silence; and at last one boy called out "Niagara Falls." The picture being considered an excellent one, Mr. Ralph ventured "Do you think you have seen anything like it in Battersea Park, near where the majority of you live." The scene was immediately recognised, and the applause that the picture and Mr. Ralph got was simply deafening.

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Holloway Social Union.—On Wednesdays up till December 16th, a number of excellent evenings have been arranged to be held at Warlter's Road Lecture Hall, Camden Road, Holloway. Season or other tickets may be obtained from the Hon. Sec., Mr. Frank How, "Oakville," Holly Park, Crouch End, N. Lantern illustrations will be used at many of the meetings. The series commenced last month, and will be continued as follows:—November 4th, vocal and instrumental recital; November 11th, lecture, Ralph Waldo Emerson, a study; November 18th, soiree; November 25th, discussion, "George Meredith"; December 2nd, dramatic recital; December 9th, lecture, "Socrates"; December 16th, Christmas entertainment.

◆ ◆ ◆

A Lady Lecturer and Slide Maker.—When the Rev. I. M. Bacon went to Norway a short time ago with the recent eclipse expedition he was accompanied by his daughter, who took a great number of photographs. These she has converted into lantern slides, and has also written an interesting account of the expedition. This illustrated lecture she gave for the first time a fortnight ago at Newbury, under the presidency of Sir Francis Jeune. Miss Bacon was highly complimented, and the entertainment was voted a huge success.

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Lantern Slides and their Production.—In the course of a lecture at the North Middlesex Photographic Society, Mr. E. Docree maintained that with gelatino-bromide plates as fine results could be obtained as with collodion, added to which there was the advantage of rapidity; also that much finer slides were obtained by reduction than by contact. He got all his clouds on the same negative by first using a weak developer, then a stronger restrained one.

◆ ◆ ◆

New Method of Generating Electricity.—News comes to hand that M. Hartz has obtained a patent in France for a cheap electrical storage battery in which the electricity is generated by the vibrations of the transverse rays disclosed by Röntgen's experiments under the pressure of atmospheric air. He asserts that his apparatus can keep twenty lamps of 10 c.p. going for about 8,000 hours.

◆ ◆ ◆

New Slides.—Messrs. Newton have issued their new season's list of lantern slides, and among them we note the following series: The Queen's reign; The life of the Duke of Wellington; Wood-carving; Egypt and Nile in 1896; Italy; Prehistoric man; Poultry rearing; A further series of birds and nests, by R. B. Lodge; India; New photography; Constantinople, 1896, etc., etc.

◆ ◆ ◆

Matthews' Lantern.—The Matthews' portable lantern, introduced three years ago, and generally recognised as a pioneer of portable lanterns, has since last season been improved, notably by an enlarged hood or body, which will permit the use of an oil lamp, incandescent gas burner, acetylene gas jet, limelight jet, or electric lamp. Any of these can be mounted on the brass tubes forming the base of the lantern, and be readily adjusted and centered thereon. In the details of construction every care is taken to perfect and simplify all movements so that it may maintain the high reputation already acquired.

Some American Lantern Apparatus.

THE general style of lantern apparatus in the United States is in many instances of totally different appearance to that used in Great Britain, although for some time past there has been a slight tendency in this country to introduce novelties fashioned a little a l'American. We give a few styles which are strictly American, and which are manufactured by Messrs. Charles Beseler & Co., of New York.

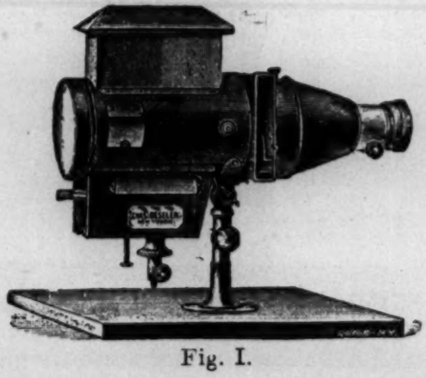


Fig. I.

In Fig. I., the lantern is small and compact, and is mounted on an upright so that it can be raised or lowered, tilted, or swung sideways. The movements of the lime, etc., are controlled from underneath, and this pattern is used exclusively in the State Normal Schools, New York.

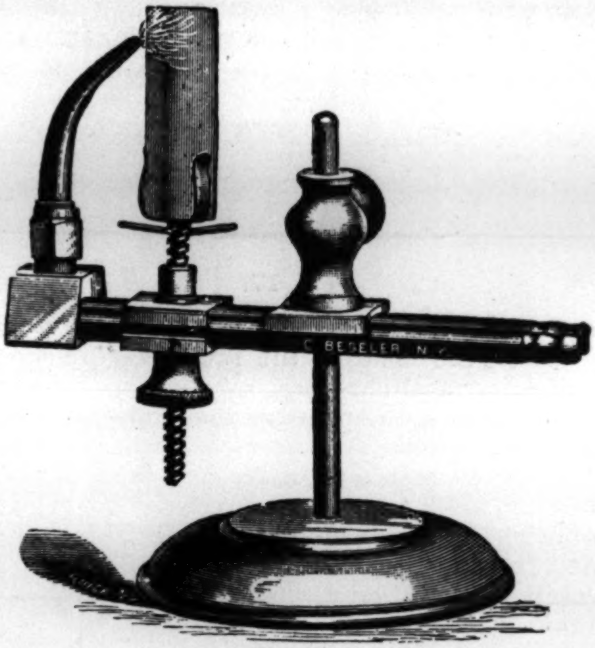

C. BESELER. N.Y.

Fig. II.

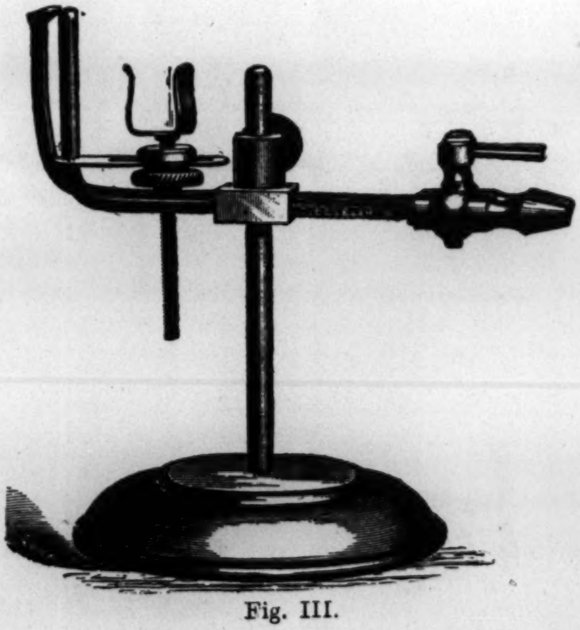


Fig. III.

Jets as a rule are, in the United States, made very short, and many are mounted as shown in Figs. II. and III. The limes it will be seen are not set on a pin, but are held by three spring clips. Some of the American cylinders may appear odd to users in this country; the cut Fig. IV., represents one made of copper rivetted. A cylinder of this class 28 by 7 inches weighs 20 lbs., and when charged at a pressure of 225 lbs. to the square inch will hold 12 feet of gas. Some cylinders are made in the same way of steel, and others again are steel, solid drawn, but none are charged to the pressure that obtains in this country.

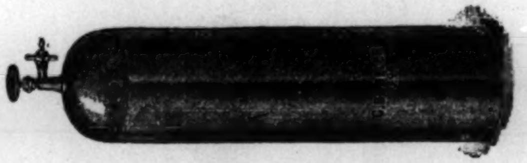


Fig. IV.

A dissolver and regulator combined, Fig. V., much in use in America, is a particularly fine piece of mechanism, and costs about £7. The oxygen and hydrogen cylinders are screwed direct on the metal tubes at O and H, and the needle valves are connected to the jets by rubber tubing. These needle valves have knobs of different shape to facilitate handling in the dark. At the side of the handle are set screws which are adjusted according to the required pressure of the gases, and provision is made in adjustment for a bye-pass.

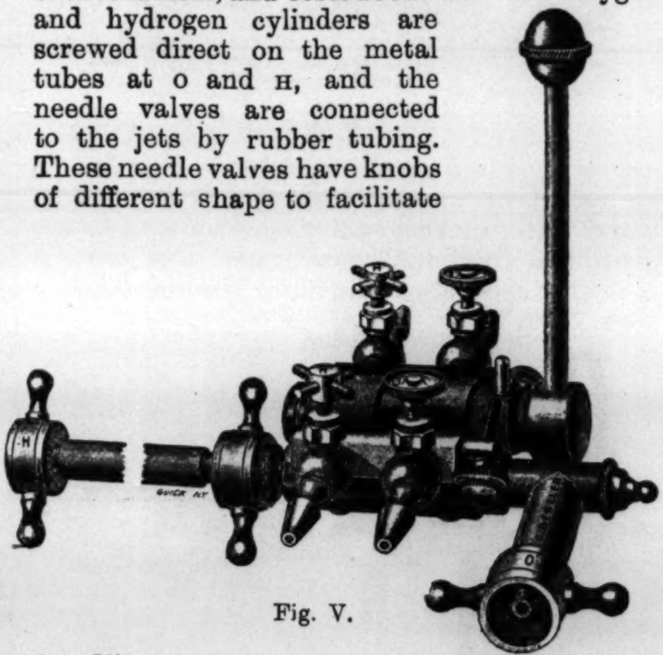


Fig. V.

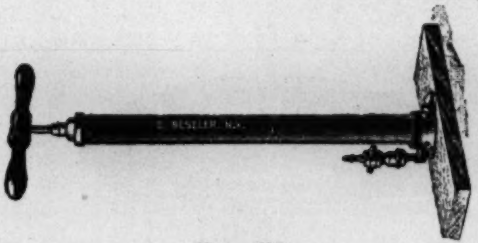

C. BESELER N.Y.

Fig. VI.

There it is not uncommon for users to make their own gas and charge their own cylinders; pumps or compressors are therefore in common use among lanternists; they are made in several styles according to requirements.

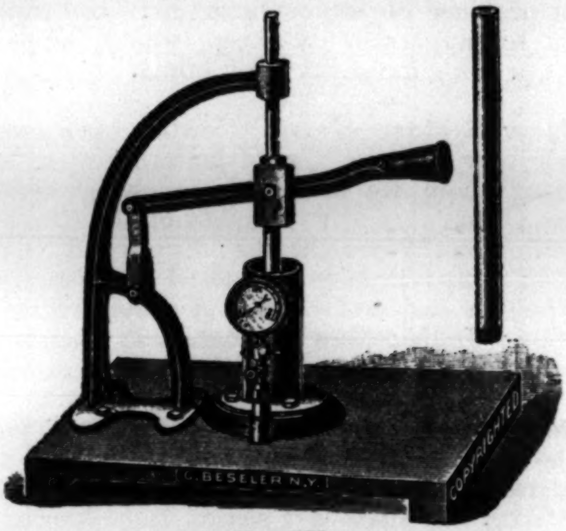


Fig. VII.

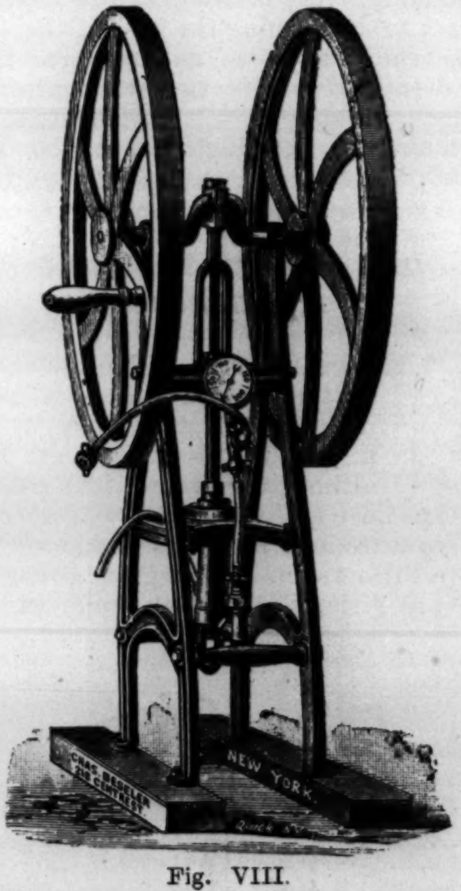


Fig. VIII.

Ordinary hand pumps are shown in Figs. VI. & VII., the small one takes up little room in an outfit, being 23 inches in height and weighs about;

6 lbs. With such, gas can be compressed to 100 lbs. to the square inch. A larger and more complex compressor (Fig. VIII.) will compress to 300 lbs. to the square inch, and with it a 25 feet cylinder can be charged in about 10 minutes.

In a communication from Mr. Jex. Bardwell, of Detroit, U.S.A., he speaks of having tried all the English regulators, and the difficulties with such from climatic influence, and speaks in great praise of the Beseler regulator, as by means of an adjustable screw the pressure can be regulated from one to fifty pounds pressure.

Prominent Men in the Lantern World.

No. 1.—Mr. WALTER TYLER.

MR. WALTER TYLER first saw the light in 1850. After the usual escapade of boyish life, during which he was always "experimenting," he settled down to a commercial experience in a large house of business.

It was in 1876 that he discovered his true mission in life—that he found out that his future history must be bound up with the "Optical Lantern."

1858.

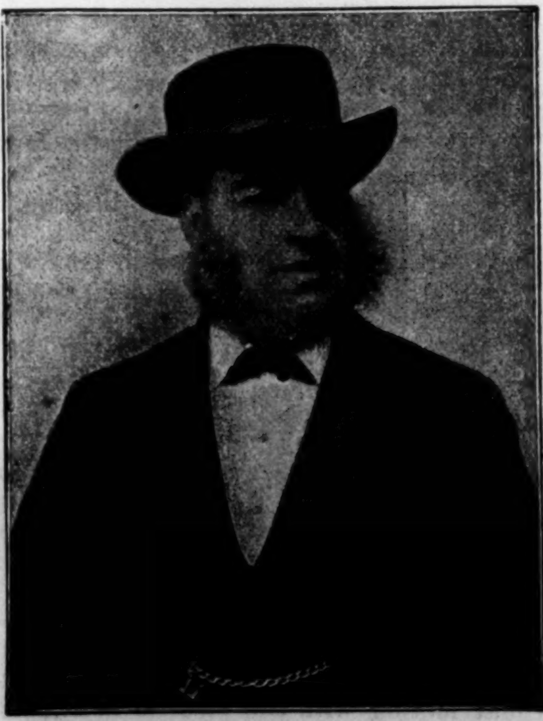
Just twenty years ago, Mr. Tyler was giving lantern entertainments in the country, and he so succeeded that his lantern outfit was invariably purchased in the town which had the benefit of his exhibition. He never lost the opportunity of gratifying his true commercial instinct—but he never remained "lanternless" long, and a complete outfit was always ready for the next town.

In 1885, he took a small shop in the Waterloo Road, and that was the origin of a business which may now be described as "colossal." It is a significant fact—the value of which will be appreciated by all commercially minded men—that the development of Mr. Tyler's business, though rapid, has been "natural."

1870.

The small shop served the public so well, that a larger shop—48, Waterloo Road—had to be taken, and since 1891 he has been continually "lengthening his ropes and strengthening his stakes." To 48, Waterloo Road, No. 50 had soon to be added, then No. 94 was purchased. In addition to business premises, Mr. Tyler has acquired a freehold estate—for residence—at Twickenham.

Another bit of enterprise that will give great satisfaction to his customers, is, that he has just purchased the Oxygen Compressing Works at Sheffield Street, W.C., which were formerly owned by the Central Oxygen Compressing Company.



1896.

Of Mr. Tyler's personality it is not our province to speak—suffice it to say, that the keen and shrewd "man of business" has not been found incompatible with genial *bonhomie* and charitable good nature. It may be enough to say that judged commercially, or socially, Mr. Tyler has deserved all the success he has achieved, and this fact even his keenest competitors would readily admit.

The Lanternist's Practical Cyclopædia.—No. I.*

By CHARLES E. RENDLE.

THIS, and a few articles that will follow, have been prepared as a ready reference to terms and technicalities, with their definitions in substance, in as concise a form as possible, to all lantern matters in general use, embracing its apparatus, its accessories, its photography, and its chemistry, and they are specially dedicated to the youthful readers of the Optical Magic Lantern Journal.

The future lanternists and lecturers who are to charm audiences with their descriptive powers and pictures of the works of God and man, who are to conduct their patrons through mines, seas, and rivers, over mountain ranges and glaciers, hills and valleys, who are to teach the progress of scientific research through the world's ages; who are to instruct their fellows in geographical wonders, history and travel, are but boys to-day, and being but boys, have much to learn.

The study of the lantern, like all other studies, cannot be mastered in a day, a week, or a month. Its science is not achieved merely by perusing a volume or volumes, though it can now boast its own literature, much in the same way as other sciences. Word of mouth instruction is sometimes useful. It is, nevertheless, absolutely valueless without the practice essential to complete the meaning conveyed.

The optical instrument of the present is no more on a par with the magic lantern of the early part of the century than the rushlight is on equal footing with the electric light, and a weak fallacy is it to suppose there is nothing to learn on the lantern subject. One might as well say that because a man is capable of uncapping a lens and recapping it after a given number of seconds, it establishes him a proficient photographer, and readers can testify such false reasoning could be multiplied *ad libitum*.

May I emphasise an acknowledged fact to intending students, that they cannot know too much.

The lantern, with its object lessons, its inventions, and its photography is, to me and many of my personal friends, the most fascinating of fascinations.

I therefore hope that the following explications and brief vocabulary of the lantern's tecnics—imperfect as they are—which form the lanternist's curriculum, will be of some slight service, and if so, then the object will have been gained.

Aberration of Light.—The power of light deviating from a direct course; the division of the rays of light when refracted by a lens, or reflected by a spectrum.

Accessories.—Those parts of apparatus which when added, form ornaments, or help in making the whole more complete.

Acetic Acid.—The pure acid of vinegar and sour grapes. Its compositions are hydrogen, four atoms; carbon, two atoms; oxygen, two atoms. Its principal acetates or salts are acetates of lead and copper.

Acetylene Gas—The gas given off, by immersing any given quantity of calcium carbide in water.

Acetylene Gas Generator.—Simply consists of two cylindrical tanks, one inverted into the other, the lower one containing water. Through an aperture in the upper or floating tank, a cradle or bag is lowered containing a quantity of calcium carbide, and the gas-tight door of aperture closed. As soon as the carbide touches the water, chemical action at once sets in, and as the gas generates into the upper tank, which rises with it, is ready for use, an outlet pipe and stopcock being affixed for that purpose.

Achromatic.—Transmitting pure light.

Achromatic Lenses generally consists of a convex lens and a concave lens, the former being cut from crown glass, the latter from flint glass. The resultant of this combination is that the many-coloured rays of light are brought to a distinct common focus. The discovery is attributed, whether rightly or wrongly, to John Dolland, optician, A.D., 1758.

Acids may be divided into two classes, according to their derivation, *mineral acids* and *organic acids*. Carbonic, sulphuric, nitric, and hydrocloric are mineral; tartaric, oxalic, acetic acids, etc., are organic. An acid is that which, coming in contact with a something or base, forms a salt. Acids containing water are hy*dro*gen or hy*dra*ted, and acids free from water are known as *anhydrous acids*. Acid—sour to the taste.

Actinism.—The chemical properties of the sun's rays as shown in photography.

Actinograph.—An instrument by the aid of which actinic effects may be registered, and for photographic purposes, essential exposures ascertained at various seasons of the year.

Actinometer.—A scientific instrument for gauging the power of the sun's actinic rays.

Adjustable Jet.—A jet that can be easily fitted to various forms of lanterns (see jets).

Aerometer.—A contrivance for finding the weight and density of air and gases.

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Air.—The common name for the atmosphere that surrounds us, and which we breathe. Its principal constituents are nitrogen and oxygen, with a small proportion of carbonic acid gas and aqueous vapour; it also contains small particles of solid matter, which are distinctly visible in the sunbeam. The weight or pressure of air—which is never at rest—is approximately 15 lbs. upon the square inch at the sea level, which is ascertained and gauged by the barometer.

Air-Condenser.—An apparatus for condensing and compressing the air.

Albumen.—In the purest state is found in the serum of the blood and white of eggs. It contains hydrogen, oxygen, nitrogen, carbon, and a little sulphur, hence its complexity. It is well known that the white of eggs is insoluble in water, and when boiled forms a hard substance; this is known as insoluble albumen. It can be dissolved, however, in a saturated solution of potash or any other alkaline. Soluble and insoluble albumen are one and the same in their chemical composition.

(*To be continued.*)

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The Invention and Development of the Optical Lantern.

By **EDWARD DUNMORE**.

CHAPTER VII.

We now come to the jets which are of two kinds, the mixed gas and the blow-through. There are many forms in the market of either kind—good, bad, and indifferent. As just stated, the mixture of the two gases forms an explosive compound, so the safety jet provides for this in a small chamber anterior to the point of issue. By the adoption of this device, termed the mixing chamber, which was first introduced by Hemmings (being a short tube closely packed with fine wire), under the title of the safety jet, it was supposed the flame would not pass back to the reservoir. The oxygen jet being inside the hydrogen jet and rather shorter than it, the danger of explosion was thought to be neutralised. The plan was not, however, thoroughly reliable, instances occurring where the flame passed through the packing. The probability is that it was not the principle, but owing to the particular jets in question being imperfectly packed, or with insufficiently fine wire that accidents occurred.

I possessed a jet some years ago, the packing of which was with coarse wire, that, on the face of it, would certainly have been unsafe in case of any sudden withdrawal of pressure from the bags, but provided the wire packing was extremely fine and well wedged together, there seems no reason why it should not answer the purpose perfectly. The mixed gas will give a much brighter light than the blow-through jet, but a very great deal depends on the shape and position of the orifices of the O and H pipes with regard to each other. The H bore should be considerably larger than that of the O, the purposes of the hydrogen being only to supply the heat which the oxygen stimulates. If the hydrogen supply is too small the light immediately becomes less; the same effect takes place if the supply of oxygen is too large. A proper balance between the two gases is necessary, or the light may be extinguished with a series of smart reports, or a crackling noise; this is especially the case when the full supply of oxygen is suddenly turned on. The usual plan is to turn on the hydrogen flame and make the lime thoroughly hot, then the oxygen by degrees until the lime becomes strongly incandescent and keeps steady without any noise or hissing; the more of each gas that can be properly used the better the light. In all good jets there are means provided for turning and raising the lime as it becomes pitted with the flame, and so deflecting the flame. The domestic supply of hydrogen is often deficient, so when the connection is made direct from the fittings to the lantern, it is of no use attempting to make up for the want of pressure by extra oxygen, which would probably have the effect of putting the light out altogether. In cases of deficient or entire absence of house gas, an apparatus has been devised, termed a saturator, which intervenes between the oxygen supply and the burner, taking the place of the spirit lamp in the oxycalcium arrangement. It consists of a shallow metal vessel filled with fibrous material saturated with ether or some light hydrocarbon, and the oxygen in passing through this box becomes saturated with the vapour of the ether, etc., which being highly inflammable takes the place of the hydrogen, and really forms a very good substitute for it. When first introduced, either from mismanagement or inherent defects in the apparatus, several explosions occurred, which militated against their general adoption; however, at the present time several devices are on the market that are perfectly safe, and form extremely useful adjuncts to a lantern outfit, to wit, the Lawson, Timberlake, Scott, Gridiron, Pendant, etc., etc., saturators.

The earlier forms were placed in the lantern below the light, but recently other forms have been devised that are used outside the lantern and entirely distinct from it, with a charge of ether, representing a definite number of feet of hydrogen—an evident advantage, as it forms a guide to the time it will take to exhaust it. All saturators should be filled by daylight, and never in the vicinity of a light or fire, owing to the very dangerous inflammability of the ether.

It may be mentioned that ether vapour is heavier than air, and will flow a considerable distance along the ground before getting sufficiently diluted with air to become innocuous. On account of its gravity, any light below it will be more dangerous than one raised above. A fire in a grate three or four yards distant would be more dangerous than a light half that height above it. Mr. Blanchard, the well-known photographer, nearly lost his life by an explosion of ether caused in this manner, although the light was a considerable distance away—I believe in an adjoining room. Therefore, in dealing with so inflammable a liquid, extra precautions should always be used, as an open window or door to the outside air.

An important part of the lantern fittings is the dissolving tap — an arrangement of tubes and valves which by a simple lever movement cuts off the supply of gas wholly or partially from the jet. When two or three lanterns are in use at the same time, the convenience of such a contrivance is obvious. In some forms of this compound tap, bye-passes are attached that will effect the practical extinction of the light in any single one of the lanterns, and light up again immediately the lever is turned. Mr. Steward, of the Strand, has recently brought out a system of this kind, acted on by screw-down valves, and a fine adjustment by which the light can be reduced to a mere bead, or raised to the original height by simply turning a lever. These "cut-offs" have superseded the serrated screens used for dissolving effects, and at the same time economised the gas. In general appearance they consist of a number of short nozzles (suitable for the attachment of the india-rubber tubing) projecting from a central block, supplied with taps or levers that control the passage of the gas to the whole of the lanterns in use; the convenience of such an arrangement is very evident.

CHAPTER VIII.

The light being once properly started, a means of perfect control is afforded without opening the lantern and admitting a flood of light on to the operator and into the room.

The limes are cylindrical compressed blocks of lime or other oxides, with a hole through them for fixing to the spindle of the jet; they are supplied in tins packed with quicklime, and supposed to be hermetically sealed, but at the time of writing I have by me two boxes that had not been previously opened, burst both at side and end owing to absorption of moisture by the quicklime through the metal, or perhaps more likely to imperfect soldering. Limes are now supplied, each one hermetically sealed, in a glass tube; a great improvement in both cleanliness and for preservation, for it was almost impossible to keep a tin of limes once opened in good condition for long, so absorbent are they of moisture that they soon become soft and powdery, and useless for the lantern. In lighting up, the heat should be gradually applied, or they will crack and flake off; there is, however, a great deal of difference in this respect with different makes of limes—the better they retain their shape, the better light they give. Although other substances have been tried, up to the present time lime has been found to give the best light, and is universally used. Some years ago flat discs were introduced, supposed to be made of oxides of zirconium and magnesium, which were to supersede the lime cylinder both in permanency and quality of light, but I believe they developed some failing that left the old lime master of the situation. The "hard" or Nottingham limes are generally preferred; the soft limes are only usable with a blow-through jet, and will not withstand the heat of mixed gas. The shape is usually cylindrical, but they may be had fluted, which shape has the advantage of preventing the flames wrapping round them.

When lighting up, as already mentioned, the hydrogen should be first turned on to play on the lime which is fixed on the spindle of the jet, and about an eighth of an inch from it, or nearer; this will warm up the lime and also the inside of the lantern, preventing, in cold weather, condensation of moisture on the condenser, which often happens when the temperature of the condenser is below that of the room. It may be left quietly burning for ten minutes or so, then, if compressed oxygen is to be used, turn the jet in the lantern full on, and regulate it from the lever attached to the bottle; if you attempt to regulate it with the tap in the lantern, the probability is the pressure will blow off or burst the india-rubber tube. The amount of gas is regulated by the appearance of the disc on the screen, but a little practice will soon teach the operator how the flames and lime should appear; the centre of the light, that is the incandescent portion of the lime, should be exactly opposite the centre of the condenser. We draw the jet back a few inches, and gradually advance it until the disc on the screen is evenly illuminated, for until the exact distance is ascertained, a shadow will appear on the disc, and its edges will not be sharply defined; as soon as this is done, put a slide in the carrier and sharply focus it. The jet being fixed by the screw in its place, the light can be turned off, and the lantern is prepared for the exhibition.

(*To be continued.*)

Architecture as a Subject for Lantern Slides.—No. I.

By T. PERKINS.

ALTHOUGH a variety in the style and subject of slides is pleasing alike to the spectators and the exhibitor, yet there can be no doubt that the man who makes one class of subject his speciality, will turn out better work in that class than one who tries to produce slides of all kinds—landscapes, seascapes, figures, portraits, animals, flowers, architecture, etc. Any one, moreover, who is a specialist, if he wishes to get together sets of other subjects, will generally not find much difficulty, that is, if his own work is good, in making exchanges with specialists in other branches of slide making.

Architectural subjects are those which have most interest for me, and I have made more negatives and slides of old buildings than of all other subjects put together. There are many reasons, as it seems to me, why architecture lends itself more readily to slide making than most other classes of photographic work, and why the making of such slides is peculiarly valuable and interesting. There is, in the first place, no other subject, save sculpture, that owes less to colour for its charm, more to simple form, and light and shade. Moreover, the various colours of the stone which may be seen in different buildings, whether it be the ruddy hue of red sandstone, the warm yellows and browns of freestone, the colder tint of limestone or blue lias, or the blackened walls that we meet with in old city buildings, can, to a certain extent, be represented by developing the slides in various manners, for we have only to take up the directions for developing most of the lantern plates on the market, save those made especially for black tones, to see that black, purple, brown, and red, may be produced at will by altering the exposure and the constituents of the developer, so that the picture thrown upon the screen may represent very closely the appearance of the original. This cannot be said of all subjects, hence the attempt, always more or less of a failure, frequently made to make the picture more life-like by colouring the slide with paint.

Again, the collecting of architectural negatives leads to the study—and a most interesting one it is—of architecture, with its kindred subjects of archæology and history, and once again in an age like this when antiquity is so little reverenced, and one after another old churches are tidied up, re-roofed, re-floored, and re-seated, so that their appearance is often entirely changed; when to make room for new streets, new railway stations, old buildings, whose stones have been weathered by the summer suns and winter frosts of many centuries, whose hard lines and glaring hues time has softened with his mellowing hand, are swept away without compunction, it is interesting to have some authentic record, such as a lantern slide best can give, of what the altered or destroyed building was like before the restorer or destroyer laid his hand upon it. But, perhaps, enough has been said as a plea for architectural photography undertaken with a view to the production of slides, and it is time to turn our attention to the practical work of obtaining the negatives. Some previous knowledge of architecture will be a great help to the photographer taking up this work; if, unfortunately, he knows nothing about it, he should make haste to remedy the deficiency. Rickman's "Gothic Architecture," Parker's "Glossary," "An Introduction to Gothic Architecture" by the same author, and "Domestic Architecture of the Middle Ages" by Turner and Parker, are the most complete treatises on the subject. If these on the ground of size or expense are unobtainable or inconvenient to use, a smaller work, "Handbook to Gothic Architecture," by the writer of these articles, illustrated by process blocks from photographs of the actual buildings, chosen as examples (published by Hazell, Watson & Viney), will probably be found useful. Whatever book is chosen, it should first be carefully studied at home; thus a good general idea may be obtained. Then each negative taken should be printed, or better still, a slide should be made from it; and this print or this slide, projected on the screen, should be studied point by point, detail by detail, with the help of the book.

If it should be possible, it would be well to visit some building described in the book, and having previously made a list of the principal parts worth photographing, to do these and use the finished slides as illustrations to be studied with reference to the text. It will be found surprising how soon a knowledge of architecture may be thus obtained, and when it is obtained the pleasure of a tour in a district rich in architectural remains will be enhanced ten-fold. It will be seen that, though the study of architecture should be commenced before actually making exposures, yet further theoretical study and the practical work of obtaining negatives should go on hand in hand.

Before I speak of the apparatus most suitable for the actual photographic work, I will, for the convenience of beginners, give a synopsis of the various styles or periods of Gothic architecture.

Saxon, which prevailed up to the time of the Norman Conquest, and in some out of the way districts somewhat later, may be known by triangular headed doorways and windows, by baluster shafts especially in belfry windows frequently associated with round heads to these windows, "long and short work" as it is called along the corners of the walls, that is stones set alternately, horizontally, and vertically, the vertical ones being the longer, and by ornamental strips like beams of timber on the face of the walls. Remains of this kind of work are most generally met with in towers, the churches having in most cases been rebuilt while the tower was left standing.

Norman, introduced shortly before the Norman Conquest by Edward the Confessor, and gradually becoming general and lasting rather beyond the middle of the twelfth century, when it gradually passed through a transition period lasting nearly to the close of the century into the Early English, may be known by semicircular headed windows and doorways, the former generally narrow and always destitute of tracery, which, however, in some cases was afterwards inserted in the original windows, and the latter as time went on being more and more elaborately carved with many orders of recessed mouldings, by semicircular arches, massive pillars, low central towers, and flat buttresses.

Early English, which grew out of the former through the transition above mentioned, and prevailed during the thirteenth century, may be recognised by narrow windows with pointed or lancet-shaped heads, often grouped by twos or threes under a common dripstone, pointed heads for doorways, and similarly shaped arches supported by slender pillars often formed of a central core with smaller ornamental detached shafts clustered round it by loftier towers often capped by pointed spires, these generally being of the type called "broad spires," that is, built with overhanging eaves, and the plentiful use of projecting buttresses.

The Decorated, which was the prevailing type during the first half of the fourteenth century, is marked by the windows having tracery, at first of a simple geometrical character, later consisting of flowing lines. Spires of this period often rise from within the parapets of the towers.

The Perpendicular, which came into fashion towards the end of the reign of Edward III., and lasted until the reign of Henry VIII., when it was gradually supplanted by the Renaissance and revived classical forms, can never be mistaken for any other style. Its chief characteristics are straight lines running from the bottoms of the windows right through their heads to the top, the profuse employment of panel work as an ornament on wall surfaces, the division of the towers by horizontal lines into stages and the four centered arch. Spires went much out of fashion during this period; the towers, however, are in many cases very lofty and handsome.

After this time Gothic architecture died out of England until the modern revival took place, when many buildings have been erected in imitation of the old style. The student should learn to distinguish genuine old work from modern imitation —this is generally not difficult to do. The old work has more life and character about it, the modern is more regular and looks as if it had been made by a machine; as a matter of fact, it has been executed from office-made drawings, whereas in the old work something was left to the individuality of the carver.

(To be continued.)

The Electric Light in the Optical Lantern.—No. I.

By **CECIL M. HEPWORTH.**

EVERY great boom leaves its mark behind it. The greatest boom the lantern world has ever seen is that which is still reverberating throughout the land—the boom of the living photographs, and one of the results that it will leave behind when it is over will be a marked popularity for the electric arc light as an illuminant for the optical lantern. All kineti-projection apparatus use up a tremendous amount of light, and nothing but the electric arc has been found capable of supplying that light in sufficient intensity for any but the very smallest screens.

The greatest obstacle to the spread of electric light for lantern work lies in the fact that is is only at comparatively few places of lantern entertainment that suitable electric current can be "tapped," and there are so many almost insuparable difficulties in the way of its production specially for the purpose, that such a course is, generally speaking, impracticable, and its consideration may be left out of the argument altogether. However, this difficulty is fast disappearing, for every week brings the announcement of new supply companies being formed to light fresh districts electrically, while older institutions are ever increasing their range of usefulness, annexing whole towns to their own particular area, and sending the "subtle fluid" through new arteries, to carry light to many an outlying suburb.

Let us see what are the essentials to the production of the electric arc light. First of all there is the supply of electrical energy which may be—and almost always is—produced by a dynamo, wherein it is converted from the mechanical form, or an electric battery may be its source, in which case its derivation is chemical. Of course, electrical energy cannot be "created" any more than any other form, and it may be of interest to note that the amount of mechanical energy required to sustain an arc light for lantern purposes is equivalent to about two horse-power.

The electric current, "generated" by a dynamo or other source, is led to the point of consumption—or rather to the point where its electrical energy is converted to some other form such as light, heat, or motion—by means of conducting wires or "leads" as they are technically called, and it is where these leads come to a termination that the lanternist's part of the work commences.

The function of the dynamo is to divide, as it were, into two parts the electricity, which may be taken to be present everywhere, or rather to create a plenitude of electricity at one point at the expense of another. It may be regarded as a kind of pump, which pumps this something that we call electricity out of one place, where it leaves an emptiness, into another, which therefore becomes fuller than normally. Thus a stress is set up between two points which are always seeking to equalise themselves, so that directly a suitable path is provided by which the electricity can flow from that point where it is greater than the normal to supply the deficiency where it is less, it will do so, and it will continue to flow in a steady stream, or current, so long as the dynamo keeps on pumping. But as it flows it will do work, and if the path is a simple wire, the majority of the electrical energy will be consumed in heating that wire. Suppose that at one point the wire is broken, leaving a gap say of one-eighth of an inch, which is filled, not by air (for that is a non-conductor) but by intensely hot metallic vapour. This is a partial conductor, and the electricity will make use of it as a means of bridging across the gap, but it is such a poor agent that it will experience great difficulty in passing through, and a very great deal of its energy will be expended in overcoming this difficulty—energy which will raise the temperature of the gas to a heat at which it glows with brilliant light, and which will rapidly vaporise the ends of the metal wire. Thus the supply of gas will be kept up and so it will go on until the metal ends have been consumed—either melted or vaporised, or both—to such an extent that the current can no longer jump the widened gap, and all action comes to an end. The stream of electricity which crosses the space between the two "electrodes" —as the wire ends would be called—takes the form of a bow or arch, and from this circumstance the name of "arc" light is derived.

In practice, metal electrodes are quite useless, for the light would be most fitful and irregular owing to the melting of the metal, and it would moreover be deeply coloured according to the particular metals used, thus copper yields an intensely green light. Rods made of hard carbon are employed, and this material yields a most brilliant white light, part of which only—and a small part—is due to the actual arc; by far the greater quantity coming from the incandescent points of the carbon electrodes.

The supply of partially conducting vapour between the two electrodes—which it will be remembered is a point of vital importance, for by its presence the arc is made possible—is kept up at the expense of the electrodes themselves, which are thus slowly consumed. This gradual consumption has to be compensated for by continually advancing the carbon rods as they are eaten away, and this is the function which an electric arc lamp or regulator has to perform. Arc light regulators for the lantern and other similar optical purposes may be divided into two great classes: "Hand-feed" and "automatic." The latter was, strangely enough, the first introduced, owing probably to the fact that an automatic regulator is absolutely indispensable for general lighting purposes, so that the possibilities of a hand-feed lamp were lost sight of altogether, and for a long time it held the field undisputed, though the field in those days was a very limited one. Lately, however, the pendulum has swung to the opposite extreme, and it shows every sign of staying there. Mr. Davenport, lanternist to the Society of Arts, was, I believe, the first to point out in a practical manner that a hand-feed lamp would not only answer all the requirements of lantern work, but had, besides, very many great advantages over the automatic variety. Since then, when the demand for electric light in the lantern was just beginning to be felt, many things have conspired to further its popularity. There have been one or two bad—though, it must be admitted, somewhat irrational—lime-light scares, resulting in the enforcement of utterly unnecessary and vexatious restrictions upon the use of this illuminant. Electric mains have spread, like a huge spider-web,—with marvellous rapidity all over the country, and lastly many inventors—men of practical experience, have come forward with new designs and improvements and additions until the hand-feed lamps have reached a high degree of perfection.

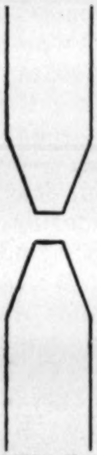


Fig. I.

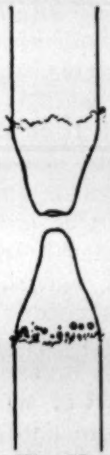


Fig. II.

Before going further let me call attention to certain characteristics of the electric arc, and to its various peculiarities and exigencies, for from a careful study of these some idea of its applicability to lantern work may be gained, and an intelligent choice made between the now very numerous lamps or regulators at the option of the lanternist, who might, without such guide, easily become bewildered by their differing claims and great variety. And let us suppose that two solid rods, equal in diameter of electric light carbon (for a material is specially made for this purpose), are held in a simple form of regulator, one above the other, so that their two ends, which should be roughly pointed, may be brought into contact, or separated to any reasonable distance, and the space between them regulated as desired. Fig. I., which represents an inch or two of the ends of these carbon rods, shows their position the one with the other. We must suppose that these electrodes--of course, insulated from one another—are in connection with a suitable source of electricity, such as a dynamo giving a current of 12 ampères or thereabouts at about 50 volts. These are technical terms used for the measurement of electricity, and for the present we need not inquire into their meaning. One pole of the dynamo, or let us say one of the two wires which form the visible part of the electric supply, is connected with each of the carbons, and we will suppose that the upper one is positive, and the lower negative. It will be remembered that a positively electrified body has been defined as that which has a superabundance of electricity, while that which is negative is deficient. As the current will flow *from* the top, or positive carbon, or "anode," *to* the negative or "cathode," it is but natural to suppose that different phenomena will be exhibited by each. To start the light—to "strike the arc," as it is called—the two carbons must be brought into contact for a moment, and then separated to a distance of about one-eighth of an inch, the reason for which manœuvre is this:—Such electricity as is required for an arc light has not sufficient power to jump across a gap of air wider than the one-thousandth of an inch, or thereabouts. Consequently, with the carbons in the position shown in Fig. I., nothing occurs. But if they are brought into contact for a moment the current immediately rushes from one to another, and in so doing—for the actual point of contact is much too small to pass such a heavy current without protest, as it were—it generates such intense heat that a small quantity of carbon is vapourised. Carbon vapour is a partial conductor, and when the electrodes are separated again it fills the gap, and the intensely brilliant arc light is the result.

If the carbon points be watched through a piece of thickly smoked glass it will be seen that they are being gradually consumed, and this consumption must be compensated for so that the length of the arc remains roughly constant. It will also be noticed that the shape of the carbon points is being modified, and that the alteration is not by any means the same in each case. The negative carbon will assume a blunt and rounded point. The positive will be slightly pointed too, but to a very much smaller extent, and at its end a small hollow or crater will be excavated. And it will soon be seen that the reason of this excavation is that particles of incandescent carbon are being torn from the upper carbon and falling upon the point of the lower in a continuous shower or bombardment, after which it will not be surprising to find that the negative carbon only burns away at just half the rate of its more energetic fellow. The position of affairs at the end of five minutes or so is represented in Fig. II. And the third thing to be notified is that by far the largest portion of the light comes from the inside of the crater of the positive carbon.

Now let us see how all this fits in with the requirements of the lantern. First of all, in order to maintain the light, some means must be provided to feed the carbons forward as they burn away, so as to maintain the distance between them at the length which experience shows to be the best. Secondly, in order that the light shall remain at one point in the optical centre of the instrument, either the negative carbon must be fed forward at half the rate of the other, or it must be only half the thickness, so as to equalise its rate of burning; and, thirdly, some means must be found of throwing all the light forward into the lens system, instead of allowing it to spread around equally. For with the carbon points placed as shown in Fig. II. the great majority of the light would be projected downwards, forming a ring of illumination around the lower carbon, as in Fig. III., where the system is shown with a small negative carbon to equalise the rate of burning—an arrangement which has the further advantage of allowing a greater quantity of light to shine from the positive crater, much of which would otherwise be lost in the shadow of the lower carbon.

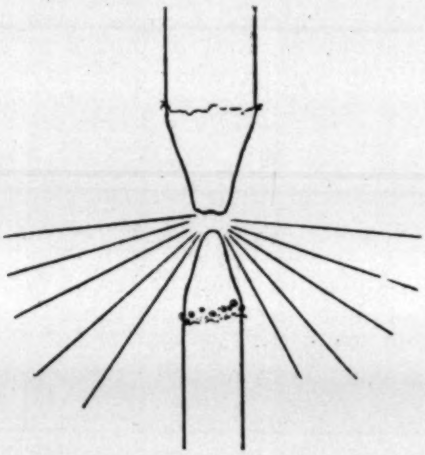


Fig. III.

With regard to the first point, I will, in the next paper, briefly point out the merits and disadvantages of automatic and hand-feed lamps respectively, and leave the reader to choose between them and between the various examples of each when he has heard all that is required from a lantern arc lamp. Concerning the slower burning rate of the negative carbon, I think there can be no question that the advantage lies with different sized carbons fed equally, for by this means the shadow of the negative rod is reduced to a minimum, and I will deal with the important subject of the projection of the light forward, towards the lenses, in the next paper.

(*To be continued.*)

Slides.—No. I.

By F. J. SCRIMGEOUR.

HOW the slide market would be "swamped" if all lanternists were to be as particular about the quality of their slides as they are about the rest of their apparatus! How we lantern enthusiasts would mutually avoid one another when we began to find one friend after another "button-hole" us in the public street, and explain that he had determined to sacrifice all those lovely slides which he bought last winter, and, as a personal friend, wished to give us the first chance of them, "as a bargain," at half-price. And how each friend would squirm, as we told him that instead of purchasing more slides, we were ourselves clearing out our stock; and with what a hasty "good-bye" would he depart as we began to explain to him that he might have all our last season's views at one-third of cost price, with discount and goodwill. I say, what times we would have if all lanternists began this sort of thing at one time! But we need not be alarmed by the picture I have drawn; a change there will be, but it will be gradual.

"The signs of the times" in the optical lantern world show that operators all over the country are beginning to remember that all the burnished brass about their apparatus, all the polished mahogany which the furniture cream keeps so bright, even their high grade condensers and perfect front lenses are only a "setting" to the small square glass transparency which is the centre of all.

This important fact seems to have been more easily kept in mind before photography became the powerful agency in relation to the lantern which it now is; for then all slides had to be made by hand, and the expense which resulted from the labour and artistic skill required for their production would not admit of their important position being forgotten. Besides the price, which frequently ran into pounds, slides measuring 8 by 5 inches were not likely to be considered insignificant!

It is most certainly the ease with which photographic transparencies can now be made that accounts for the enormous amount of trash with which the market is flooded. To-day all slides, with very few exceptions, owe their existence to photography in some form or other, and the old Polytechnic style of hand painting is now almost a lost art. But that is by no means a fact to lament.

In photography we have a power which can be used to produce, or help to produce, slides much more correct in detail, infinitely more true to nature, and as a rule finer in gradation, than the old hand-drawn transparencies, and that on a piece of glass only 3¼ inches square. Every day hand-painted photographic slides are magnified on the screen in the form of pictures far superior to anything ever achieved by the lantern before the era of photography. Such slides are the outcome of most careful work in each of the three distinct processes through which they have passed. In the first place, the negative is the production of a competent professional photographer, and is usually of a large size, for slides by reduction are better than those by contact exposures. Next in order comes the lantern slide maker, and his business is to make a satisfactory positive from the negative, pleasant in tone, and free from any sign of "muddiness" in the shadows. When this operation is completed, and the resulting transparency is quite dry, it is passed on to the colour artist who tints it with his most delicate and most transparent colours. In the tinting the greatest care is required, as each stroke of the painter's brush is greatly magnified on the screen.

Thus, competent photographers and careful painters are required for the production of first-class slides, and the services of such must be paid for. It was not slides from that box which were sent by the dealer to the minister who sent him a letter, asking him to "send on at once as many magic lantern slides as can be got for the enclosed £1 note," subject not mentioned!

With lantern plates at 1s. (often 11d.) a dozen, and such developers as hydrokinone and amidol on the shelf, the dealer can supply you with a large quantity for your bank note, but they will not be by any means first-class. If the demand for those slides, which equally deserve the titles "cheap" and "nasty," were to decline; if lanternists would "go in" for quality instead of quantity, how quickly the artistic status of the average slide would rise! And I say again, that this would soon be the case if they would only be as particular about their transparencies as they are about the apparatus, whose sole duty is to project these pictures on the screen. The slides in use now divide themselves naturally into two great classes, namely, uncoloured and coloured. In the first section, those in greatest demand are slides which illustrate travel lectures, and slides which deal with scientific subjects, such as magnetism, light, or optics. The audiences which assemble to travel lectures usually consider the slides from an educative point of view, and, therefore, the want of colour does not matter so much as it might do in other cases.

The scientific slides generally take the form of diagrams, and if they are tinted at all, it is for the sake of convenience only. The reason, I think, why uncoloured sets of "life model" slides are so unpopular is because the exhibition of these is looked upon by the public as an entertainment, and in a lantern entertainment colour becomes an absolute necessity.

The dealers find that, for the same reason, untinted pictures of animals are not general favourites.

In the second section we have a much greater variety from which to choose. Here we will find, coloured, all the travel slides mentioned before, and by our first glance at them we will see that the touch of the artist's brush has raised them to a much higher platform. And we will find also that as they have risen, like the "Tin Gee-gee," in the social scale of Slideland, their intrinsic value has likewise increased. Someone (the dealer himself, most likely!) has taken down the "shilling" ticket and marked them at prices varying from "one and nine" or "two and three" up to ten or fifteen shillings. Certain slides are easily coloured and do not require extreme skill on the part of the artist. These are for the most part views which do not contain many figures, and therefore they may be got at two shillings or two and six, and yet be "as good as they make 'em." But then there are many which can only be made very second-class for the same money. For instance, great care as well as ability is required to tint pictures in which large numbers of people are seen, and there are many slides which owe all their beauty to a sky which is the creation of the painter's brush. In both these cases long training as well as efficient judgment is necessary to blend the colours, so as to make the whole slide most effective when shown on the screen. A certain amount of general information must also be possessed by an artist when painting typical foreign views, or mistakes in colour will often be made which will be noticed at once by certain audiences.

As I write I have a slide in my mind which is a good instance of this. I got down from

London a comparatively cheap slide of the grand canal in Venice to fill up a gap in my Italian set. When it arrived I found that the artist, having evidently more red paint than information, had coloured the largest gondola in the picture a brilliant scarlet. Now I knew that any person in my audience who had been in Venice would know that by Act of Parliament all gondolas are coloured a sombre black and appear to the visitor like so many hearses!

(*To be continued.*)

Animated Photographs.

By G. R. BAKER.

FOR many years past the optical lantern world has been interested in the results obtained by taking a series of photographs of living objects in rapid succession for ultimate projection on a screen, but the climax has been reached during the past twelve months, since the results of the labours of Mr. Birt Acres, Messrs. Lumiere, and Mr. Paul have been before the public. The introduction of Edison's kinetoscope and the wonderful effect produced for individual observation was only a preliminary to some similar effect capable of being seen by hundreds of persons at one time, and the designing and construction of an apparatus for such a purpose followed as a natural consequence. The difficulties in new apparatus is generally great, especially if mechanical as well as optical problems have to be solved; but in this instance, with the continuous roll of photographic records an accomplished fact, engineering skill and the optician's aid managed the remainder. The films of the kinetoscope, although sharp and well defined and satisfactory for visual observation, are not, as usually supplied, suitable for projection, for they are too dense and consequently do not allow sufficient light to pass through to appear bright on the screen. With the films specially printed so as to ensure transparency, the results are much superior. When one first sets about constructing an apparatus for the projection of kinetic photographs, the plan of a revolving wheel or disc with an aperture in it as used in the kinetoscope is naturally tried, but it is soon found that little or no light is the result on the screen. Hence some mechanism and shutter must be employed that will permit a momentary stopping of the film and an exposure of a definite portion of the same, so that the whole or nearly the whole of the light from the luminant passes through and is projected on the screen. To do this without vibration and the minimum of noise is the task set the instrument makers. The light can be managed all right, for almost any power is available with the electric light, but provision has to be made for protecting the films from injury by the heat rays, and this is done by a water trough. The front lens has to be of very short focus to get the necessary enlargement of the little film pictures so as to appear a reasonable size in a moderate-sized hall or room, but if the distance is great a longer focus can be used and proportionately more light obtained. The focus of the objectives usually employed is from two to four inches equivalent focus.

In searching the Patent Office records, one finds that Wordsworth Doristhorpe and William Carr Crofts, both of London, made application in August, 1889, for a patent which was duly accepted in November, 1890, for "Improvements in the production and representation of instantaneous photographic pictures." The following abridged description will show that these inventors were on the track that has culminated in the cinematographe, animatograph, and a dozen other graphs:—

"The pictures are produced upon a sensitive film or surface carried by a long roll of paper or other material. The roll is continuously unwound from one drum and wound on to another drum. A screen is provided between the lens and the exposed sensitive surface. This screen travels out of the way to permit the image to fall on the sensitive surface, and covers the lens again as soon as the exposure is complete. The operation takes place with regularity, and usually with great rapidity, so that several pictures are taken in each second. A band is provided with two perforations to make these exposures. Positive pictures are taken from the strip after development, and a similar band of positives is produced and rendered transparent by application of vaseline or oil or other suitable process. The data started from is that the eye receives an instantaneous impression and retains it for one-seventh of a second. The regular intervals should be 8 to 6 per second, and for projection the blank interval one-sixteenth to one-twelfth per second."

In the above the main principles are those that have been so successfully brought to an issue by Lumiere, Birt Acres, Paul, Friese Greene, and others; the details of shutters, spocket wheels, intermittent action, star wheels, being modified in each invention so that the designer or constructor can claim an improvement, while the introduction of celluloid films has made it possible to have a suitable base for the sensitive film, either negative or positive (transparent) of practically unlimited length.

◆

Fresh Lantern Slide Work.

REVERTING to his article in our issue for last July, and his letter in last number, Mr. Albert Tranter sends us the following list of towns, with marginal notes, for the assistance of those desirous of striking out in a particularly interesting line of obtaining instructive subjects for exhibition with the lantern:—

AMBERLEY, GLOUCESTERSHIRE.—Places mentioned in "John Halifax, Gentleman."

ASTLEY, NEAR WORCESTER.—Birthplace of Miss F. R. Havergal.

BATH.—Tomb of William Beckford, author of "The Caliph Vathek."

BEMERTON, NEAR SALISBURY.—Residence of the poet, George Herbert.

BRISTOL.—Birthplace of the poet Southey.

CHALFONT, ST. GILES, BUCKINGHAMSHIRE. — House occupied by the poet Milton during the Great Plague.

CLEVEDON, SOMERSET.—"Coleridge Cottage."

CLEVEDON, SOMERSET.—Memorial tablet to Arthur Hallam in St. Andrew's Parish Church, *vide* Tennyson's "In Memoriam":—

> "And in the dark church like a ghost
> Thy tablet glimmers to the dawn."

ELSTON, BEDFORDSHIRE.—Birthplace of the poet, John Bunyan.

FAIRFORD, GLOUCESTERSHIRE.—Birthplace of the Rev. John Keble, author of "The Christian Year."

GATCOMBE, MINCHINHAMPTON.—Residence of the late Mr. David Ricardo.

NETHER, STOWEY, SOMERSETSHIRE.—Residence of the poet, S. T. Coleridge. (Now "Coleridge Arms.")

UPHAM, HAMPSHIRE.—Birthplace of the poet and divine, Edward Young, author of "Night Thoughts."

HORSHAM, SUSSEX.—Tablet to memory of P. B. Shelley in the Parish Church.

SHEFFIELD.—Monument to James Montgomery, the poet and hymn writer.

BRADFIELD, ESSEX.—Residence of Sir Edwin Arnold.

ROWTON, SHROPSHIRE.—Birthplace of Richard Baxter, author of "The Saint's Rest."

KIDDERMINSTER.—Statue to last named.

LAURENCEKIRK, KINCARDINESHIRE.—Birthplace of James Beattie, author of "The Minstrel."

FIELD PLACE, SUSSEX.—Birthplace of Percy B. Shelley.

VIA REGGIO, ITALY.—Monument to last named.

ECCLEFECHAN, DUMFRIESSHIRE.—Birthplace of Thomas Carlyle.

HEBDEN BRIDGE, YORKSHIRE.—Birthplace of John Foster

Environment.

By H. A. SANDERS.

ON page 61 of that admirable shillings' worth, the MAGIC LANTERN JOURNAL ANNUAL, there is a very good article on "The Dignity of the Lantern," and there is much in it with which I, in common with no doubt many of your readers, concur; but it is wise always to look at everything from more than one point of view. Let us see if we cannot view some of Mr. Nash's "views" from another point, and make them "dissolve" a little, if not disappear.

Take the first statement anent the decline of the popularity of the lantern. Granted! but the wherefore? The great treat of the dissolving view shows of your contributor's boyhood days was probably due to the beauty of the slides and the excellent manipulation of the lantern. Why are such beautiful slides a rarity nowadays? Has the artist's hand lost its cunning, or is it not a fact that he finds it pays best to colour a dozen photo slides on the "all-in-a-row" style, *i.e.*, a blue streak of sky, a grey streak of mid-distance, and a brown streak of fore-ground? I know men who would far rather "create" a beautiful effect, but how about the sale of it when finished? The craze for cheap work and cheap apparatus is no doubt, as the said contributor says, the root of the evil, and the "hirist" of to-day, instead of the "purchaser" of yesterday, is what most dealers have to reckon with.

The illustration of one of the greatest living authorities on natural history having his lecture "sandwiched" between a dramatic piece and a concert is no doubt very deplorable from a lecturer's point of view, but it is a question of environment, this lecturing on scientific subjects, natural history, or what not.

I speak with some knowledge of lecturers and their ways, and it is evident that they do not always study the class of audience they have to *entertain* as well as instruct. Possibly that dramatic piece, or that concert, was all the majority of the audience of that "greatest living authority" cared for, and if folks *will* try and ram dull subjects down the throats of a mixed audience, the lantern will not only take a back seat, but keep it!

Educate with the lantern by all means, but at the right time and in the right place.

Then, a word as to the "fitness of things." Curtain slides as an introduction to an exhibition of Scripture subjects may be out of place in a place of worship; may be out of place before a cultured audience or congregation; but how many lantern shows are there *not* given in back streets to a very different class of spectator? Environment again! I maintain that a decently-painted curtain slide is as *apropos* to the beginning of a Scripture lecture as a motto slide with the legend "Silence" or "Don't forget the collection"—unhappily too often the greeting on the screen whilst people are assembling. I happen also to have seen that particular "drop curtain" slide with a crucifix on it, and further, to know personally the optician who placed it in the window; and side by side with it I have seen more beautifully and artistically coloured slides than is generally to be found "ready made." Environment again!

I expect many of the "monstrous things" that neither Mr. Nash, nor myself, nor possibly that optician himself would use, find their way into appreciative hands, "in furrin' parts" for instance, where the dignity of the lantern is not considered—but something bright and highly coloured must be shown, or the seats (back and front) would be empty. Environment, once more!

Can Dissolving Effects be produced with a Single Lantern?

By R. Moss.

THIS question being so frequently asked shows that there is a strong wish among a large number of amateur lanternists that it should be so, and this in spite of the repeated assurances of experienced lanternists that it is not, and cannot be possible. The principal reason for this is that there are numbers of lanternists who for various reasons are unable to use anything more elaborate than a single, but who, for all that, want to put their slides on the screen in the most workmanlike manner possible; this, of course, being to dissolve one slide into the succeeding one, but to do this necessitates two slides being in position in front of the luminant at the same time, and also two sets of condensers and objectives, consequently perfect dissolving cannot be effected by a single lantern.

Many attempts have been, and are still being made by the makers of carriers to effect an improvement in the method of changing the slides, to bring about a good substitute for dissolving, but as yet I do not think these efforts have been crowned with success, for in all kinds, either the slides are seen to move on the screen, or a curtain appears to be lowered over the slide, and raised from the one next to be shown. Both of these are open to objections; the moving picture, whether in or out of focus, is very trying to the eyesight of the spectators, while the curtain effect, though it may be a relief to the eyes, is objected to because it leaves the room in darkness. And thus it is, that after using various kinds of improved lanterns and carriers, lanternists still ask the question: Can dissolving be effected with a single lantern? My answer is—No, and yes.

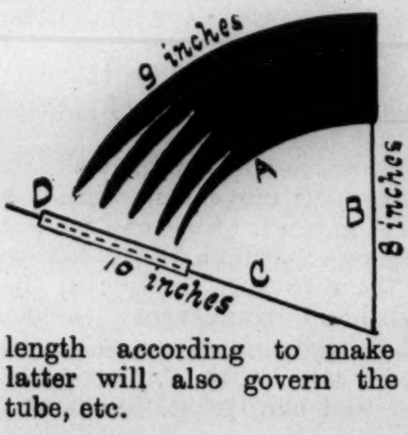
No,—true dissolving cannot be brought about in consequence of the conditions mentioned not being obtainable; still a very good substitute can be obtained by anyone with a little ingenuity and nimble fingers. It was quite by accident that I found this out, as follows:—Our operator was giving an exhibition, using two oil lanterns side by side, and a fan dissolver. Rather more than half way through, the lamp of lantern nearest him gave signs of being short of oil, there was therefore no option but to work one lantern while the other was being refilled. I happened to be on the opposite side waiting to assist with the mechanical and effect slides, so took charge of the slides in his absence. I may here mention that the lantern was fitted with a lightning carrier.

As we had a really good audience, we naturally wished to conceal our mishap as far as possible (and being up in the gallery we had a better chance of not being observed), so when next slide was signalled for, I slowly moved the dissolver over the slide as usual, and when nearly obscured, very quickly shot the carrier across and slowly withdrew the dissolver; this took less time to effect than it has done to describe, and though about half-a-dozen slides were changed by this method while the lamp was being re-lighted, no one in the body of the hall noticed the difference. I have since done it in the presence of one or two practical lanternists, who pronounced it to be the best method of changing slides—short of actual dissolving—that they had seen.

The essentials for success are an easy sliding carrier, and a very quick movement when the slide has nearly disappeared. This can be best accomplished as follows:—When the slide is to be pushed from the operator, firmly rest the middle finger of left hand upon centre of carrier, placing the thumb behind sliding part of same; the dissolver should now (with the right) be moved slowly over and slowly back again, and just at the turn, the thumb of the left hand must be brought sharply towards the hand bringing the next slide with it; but when it is brought towards the operator, the position of left hand is reversed, the thumb being rested on centre of slide carrier, and middle finger behind sliding part. Better work can be done with thumb and finger than if other fingers are used. The time occupied in dissolving off and on is about the same as if two lanterns were used, and the appearance nearly so; in fact, only an adept would notice the difference, while the darkening of screen is only momentary, and with practice would be scarcely noticeable, but, of course, slow melting away is impossible.

The dissolving fan may be fixed to the lantern stand, but is much better if secured to the right hand of the lantern itself (looking from the screen); this is easily done if it has an extended body, and once fixed, need not be disturbed. A fan to answer this purpose cannot be obtained commercially, so I will venture to suggest how it may be made.

The materials required are a piece of fairly stout tin, about 8 inches square, a piece of $\frac{5}{16}$ or $\frac{1}{4}$ inch brass or iron rod about 18 inches long, and a piece of tube 4 or 5 inches long, in which the rod will work easily. Measure from top of objective to the base of the lantern—this will be about 7 inches—open a pair of compasses 8 inches (one inch is allowed so that no light can possibly pass) and resting upon the bottom right hand corner of tin, describe a section of circle which will measure about 9 inches from end to end. Next measure outside of objective, probably $2\frac{1}{2}$ inches, allow one inch, and resting compasses on same spot for centre, describe another section of circle with the compasses open $4\frac{1}{2}$ inches; then cut out as per shape shown at A, and turn the straight edge of tin round the rod, making it into the form of a tube which will fit the rod tightly. Now bend 8 inches of rod B at a right angle, and secure the tube to the body of the lantern, 10 inches of rod C are left to work in the tube D, which can be cut to the desired length according to make of lantern, the latter will also govern the method of fixing tube, etc.



$100,000 for Lantern Work.

AN act has come into force in America in order to provide additional facilities for free instruction in natural history, geography, and kindred subjects, by means of pictorial representation and lectures. This applies to the free common schools of each city and village of the State that has, or may have, a superintendent of free common schools.

The particulars are thus enumerated :—

Section 1.—The State superintendent of public instruction is hereby authorised to furnish additional facilities for instruction in natural history, geography, and kindred subjects, by means of pictorial representation and lectures, to the free common schools of each city and village of the State that has, or may have, a superintendent of free common schools. The local school authorities may, in their discretion, cause the aforesaid illustrated lectures to be repeated to their artisans, mechanics and other citizens on the legal holidays and at other times. Any institution instructing a teachers' training class, or any union free school may have the free use of the apparatus provided by this act upon the payment to the superintendent of schools loaning the same of necessary expenses incurred in such use or for any loss or injury to said property.

Said superintendent may, from time to time, establish the rules and regulations and make and enter into the contracts necessary for carrying out the provisions of this act.

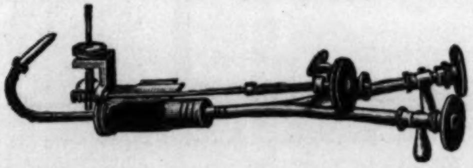
Section 2.—The annual report of each school superintendent to the department of public instruction shall contain a full statement of the extent to which the instructions described may be given, and his judgment of the usefulness of the same.

Section 3.—The sum of twenty-five thousand dollars is hereby appropriated from any moneys not otherwise appropriated, for the preparation for and the support and maintenance of said instruction for the year beginning on the first day of January, eighteen hundred and ninety-five, payable by the treasurer upon the warrant of the comptroller, upon vouchers approved by the superintendent of public instruction and audited by the comptroller; and the sum of twenty-five thousand dollars shall be appropriated annually thereafter, in the general appropriation bill, for the preparation for and the support and maintenence of said instruction for the term of four years from the first day of January, eighteen hundred and ninety-five.

NEW APPARATUS.

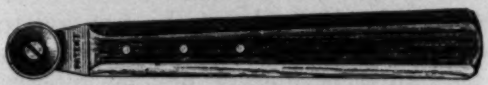
GWYER'S PATENT JET.

Messrs. Willway, of Bristol, are having a large demand for Gwyer's jet. This jet is different in general design from jets hitherto in use, the mixing chamber, which is a large one, is situated a little behind the lime, and lies in a horizontal position, and is packed after the style found most suitable by Mr. Gwyer. The movements of the lime to and from the nipple, and the rotating of the lime are controlled by two milled heads fixed on the same shafting. The smaller milled head imparts a slow movement to the lime as the end of the shafting terminates in a worm which gears with a wheel below the lime. The larger milled head controls a coarse screw, which causes the lime carrier to slide in a dovetail guide. The taps are made in three ways according to desire, viz., screw-down T, and lever taps. The jet will stand a very great pressure of gas without perceivable noise, and it can also be worked at a very low pressure without the slightest chance of snapping. The light which can be obtained with this jet is enormous. It works equally well, either with two cylinders of gas, or with oxygen and Gwyer's ether saturator, and the brilliancy of the light under these two systems is practically equal. The jet is well made, strong, and adds a new power to the lanternist or stage operator.



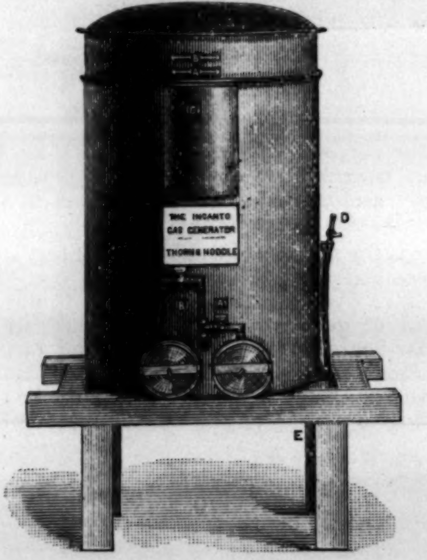
ACME PRINT TRIMMER.

A very convenient print, lantern slide mask, or cloth cutter has been introduced by Mr. Jasper Redfern, 55, Surrey Street, Sheffield. As will be seen in the illustration, the wheel cutter is made in a hollow; this enables it to be quickly sharpened, when necessary, by a few rubs on a stone, the instrument being held so that the wheel lies flat on the stone, thus the whole of the cutting edge is ground at the same time, and consequently there is no chance of putting the wheel out of true by unequal grinding. The whole thing is strong and will last a lifetime, and should a new wheel or screw become necessary, they can be obtained as they are made interchangeable.



INCANTO ACETYLENE GAS GENERATOR.—PATTERN B

Messrs. Thorn & Hoddle have brought out a generator for general lighting purposes and for installations on a large scale. One of its great advantages is that it can be recharged without in the slightest interfering with the lighting. This apparatus can be placed in any cupboard or out of the way place, and connections made with the ordinary piping laid throughout a house, as it works automatically. It is made in three sizes, the smallest being provided with only one container, whilst the others are made with two, as shown in the illustration. The largest size, which measures 26 by 36 inches, will generate sufficient gas to last 120 hours with one burner. A supply of calcium carbide is placed in each division of the two containers which are similar to drawers, and the contents of each division are acted upon by water in turn as soon as the previous one has become exhausted. This is effected by means of a small ball-cock inside of the gasometer, which allows a little water to reach the containers each time the bell of the gasometer has fallen a certain distance. On the top of the bell two lines are marked (A) and (B). When in descending the line (A) disappears, it indicates that the generator marked (B) has come into use, and that the other marked (A) is exhausted, when the tap at the (A) container can be closed, and the container



refilled without any interruption of the making and using of the gas.

"PRIMUS" NOVELTIES.—PHOTOGRAVETTE.

Messrs. Butcher, of Blackheath, ever on the look out for novelties, have brought out what they term the "photogravette" for copying illustrations from books. The following directions will show the mode for using this appliance :—

1. By gas light, place the book from which you wish to copy the print in a convenient position, about 5 feet from the gas burner. It need not be on a level. There must be no printing or damp marks on the back of the print. Care must be taken not to press against the binding.
2. Arrange the book so as not to strain the back, and lay the sheet of glass in proper position behind the picture, as in Fig. I.

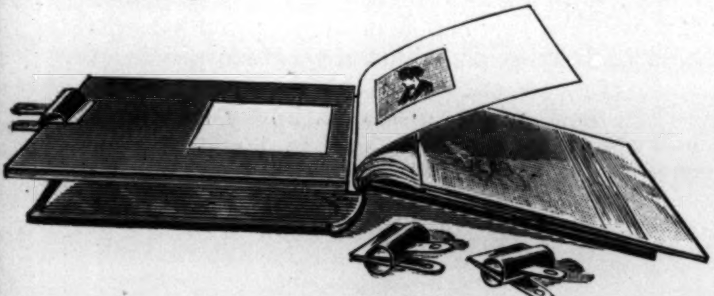


Fig. I.

3. Lay the carrier with opening (for ½ or ¼-plate as desired) over picture or portion of picture required to copy, seeing that it and the glass fit over each other. Do this by gas light.
4. Turn out the gas, and by ruby light insert an ordinary dry plate of the requisite size into the carrier, pressing *well down* on the picture. It is well to put a piece of card, size of negative, on the top to secure pressure. Lay base-board on the top of this, and clamp at the top, bottom, and sides. Turn the glass side upwards, light the gas, and expose for one or two minutes, according to density of picture and rapidity of plate.

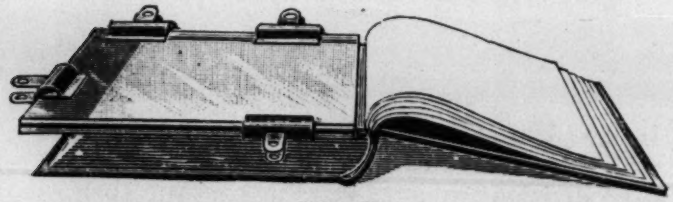


Fig. II.

5. Turn out gas, remove clips, release negative, which may be developed, fixed and washed as usual, only development must be till it is very dark at the back, or the picture will not look like an engraving.

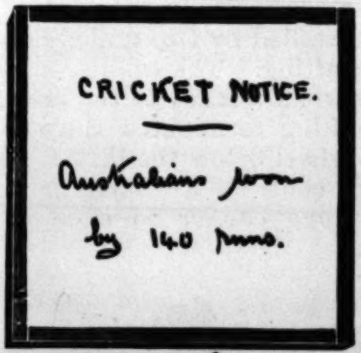
SLIDE MASKS.

Sixteen different sizes and shapes of lantern slide masks are put up by the same firm, either in one shape or assorted. These will be found exceedingly useful.

"PRIMUS" DIAGRAM PLATES

Are put up in boxes of six, with an etching point. The plates are opaque, and show white lines when sketched upon with the pointer. These plates when placed in the lantern show a picture after the style of the illustration.

NOTICE PLATES.



CRICKET NOTICE.

Australians won by 140 runs.

These are clear glass coated with a particular varnish upon which any announcement can be written with ordinary pen and ink. The ink remains with a sharp and crisp edge.

RILEY BROS.' KINEOPTOSCOPE.

There seems promise of more apparatus for the projection of animated photographs on the screen. One of the latest is that brought out by Messrs. Riley Bros., of Bradford. This apparatus (Fig. I.) is separate and distinct from the lantern itself, and can be applied to any lantern provided with a tolerably wide stage. The appliance is merely pushed in after the style of a slide (Fig. II.). We have not yet seen this apparatus at work, but as everything that is introduced by this firm is of the highest

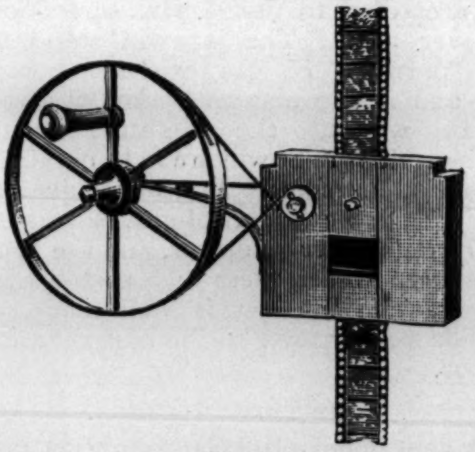


Fig I.

class, we can readily form the opinion that it will be found of a high standard, and that the claims that it is inexpensive, neat, strong, and satisfactory will be maintained.

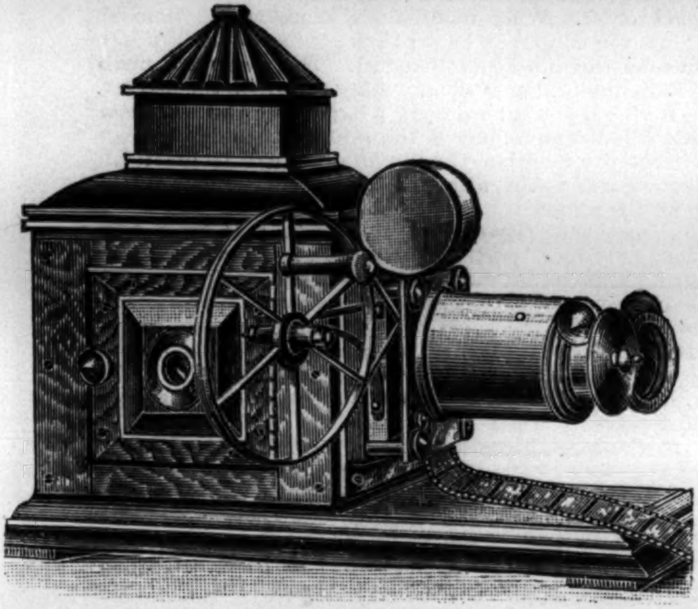


Fig II.

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The Lantern at the Royal Photographic Society's Exhibition.

ONE of the attractions at the Royal Photographic Society's Exhibition, held at 5a, Pall Mall, consists of lantern displays on Monday, Wednesday, and Saturday evenings. The programme has been drawn out as follows, and the last exhibition will take place on the 11th inst.:—

Monday, September 28th.—Slides sent into the Exhibition for competition.

Wednesday, September 30th.—Slides by Mr. J. W. Wade, "North Wales," Mr. Harry Wade, "A Wheel down the Herefordshire Wye."

Saturday, October 3rd.—Slides by Mr. John Gray, "A Photographic Olla-podrida."

Monday, October 5th.—Slides by Mr. Harold Baker, "Warwickshire Tower and Town."

Wednesday, October 7th.—Slides by Mr. Edgar G. Lee, "North Country Scenery."

Saturday, October 10th.—Slides by Mr. W. D. Welford, "The Hand Camera as a Pictorial Recorder of Holidays."

Monday, October 12th.—Slides by Mr. Eric Bruce, M.A., a Demonstration of the Aerial Graphoscope, showing Lantern Views in Space.

Wednesday, October 14th.—Slides by Mr. E. Dockree, "Odds and Ends."

Saturday, October 17th.—Slides by Mr. John Carpenter, "Still Life," and Mr. George Hankins, "Miscellaneous."

Monday, October 19th.—Slides by Mr. R. B. Lodge, "Birds Photographed from Life, and Nests."

Wednesday, October 21st.—Slides by Mr. J. H. Gear.

Saturday, October 24th.—Slides by Mr. Henry Sandland, J.P., "Animal Pictures."

Monday, October 26th.—Slides by Mr. J. A. Hodges, "Through North Devon with a Camera."

Wednesday, October 28th.—Slides by Mr. T. M. Brownrigg, "Here and There."

Saturday, October 31st.—Slides by Mr. F. H. Evans, "Lincoln Cathedral" and "Woodland Pictures."

Monday, November 2nd.—Slides by Mr. G. E. Thompson, "Life in Tripoli."

Wednesday, November 4th.—Slides by Members of the Photographic Convention of the United Kingdom.

Saturday, November 7th.—Slides by the Manchester Photographic Society.

Monday, November 9th.—Slides by Members of the Amateur Photographers' Field Club.

Wednesday, November 11th.—Slides by Captain W. de W. Abney, C.B., D.C.L., F.R.S. (President).

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Editorial Table.

"TECHNICAL INSTRUCTOR IN ARTS AND CRAFTS."—This book which is published at 1s. by Mr. William McQuhae, of Cockermouth, is a practical "enquire within" upon everyday pursuits and occurrences. It is divided into fifteen sections, and includes such subjects as building, carpentry, gilding, French polishing, lacquering, frame making, mount cutting, varnishes, cements, hygiene, and also a chapter headed "The Family Doctor." In all it contains about one thousand recipes, which will be found of great convenience in everyday life, and the possession of such a book will be of great general assistance to those of a mechanical nature.

"PHOTOGRAMS OF 1896."—London, Dawbarn & Ward, Ltd., 2s.—This work is now issued annually, it having made its commencement in 1895. It comments on the best photographic work of the year, and gives over a hundred half-tone and lime reproductions of the leading pictures. It does not deal exclusively with home productions, but also with American, Continental, and Colonial work. It is a very interesting work, is most complete, well printed, and handsomely bound.

:o:

Correspondence.

ETHER SATURATORS.

To the Editor.

SIR,—I think two or three of the statements in your article "about saturators" (page 156) are a little misleading.

First, it is made to appear that Hardwick's tank with upright partitions was invented before the porous saturator. You say, "later on a barrel saturator was tried," etc. The fact is, that my patent on the porous saturator anti-dated the invention of the Hardwick tank two or three years. I applied for my patent in March, 1882, and Hardwick first described his tank in or about April, 1885.

Previous to my invention, only a flickering light had been produced, and that with a dangerous device.

I also take exception to the judgment passed upon the "barrel" saturator. It is true enough that imperfect imitations of my models, used in ways which I always expressly condemned, have not always given satisfaction, but that is neither the fault of the inventor, nor of myself.

All of the alleged improvements upon my method of producing the ether limelight, appear to consist of means of one kind or another for securing the better vaporisation of the ether by warming it; but this was not successfully accomplished until years after I had obtained the same result by substituting light petroleum ether for sulphuric ether.

This part of the matter may be summed up as follows:—In England, where purified petroleum ether is scarce, and methylated sulphuric ether is cheap, "warm" saturators with methylated ether may be preferred; but in America, where purified petroleum ether is the more plentiful and the cheaper, it was extensively and quite as successfully used in "cold" saturators years before. Each in its place, one method is as good as the other, and both alike are subject to the original patents granted to me in America. But I do like the idea of stowing the saturator away in the lantern, instead of carrying it as a separate piece of apparatus.

Very truly yours,
F. E. IVES.

Shaftesbury Avenue,
London, W.C.

CYLINDERS PER PASSENGER TRAIN.

To the Editor.

SIR,—Seeing that the majority of railway companies will now allow cylinders to be carried by passenger train, cannot something be done to again get them carried as passengers' luggage. At present the carriage for cylinders makes it practically impossible for one to take them for a great distance, hence they must be sent by goods in the hope that they will arrive in time.

If amateurs and professionals could unite in a petition to the railway companies and Board of Trade, I think it quite possible that our point may be gained.

I shall be pleased to hear from correspondents on this subject.

JAS. W. GARBUTT
(Lanternist to Gilchrist Lecturers.)

Armley, Leeds.

—:o:—

Notes and Queries.

J. K. Mackay.—(1) When using Wood's shield, it can be removed when changing the lime. (2) It does not tend to crack the condenser. (3) The opening is sufficiently large to allow of its being seen for adjustment purposes. (4) Rack work is the best if the fitting be carefully done, but if carelessly effected there is chance of a slip between the teeth, in which case the whole thing becomes a nuisance. (5) The curtain to which you allude is a good one.

A. Pexton.—We do not see how you can improve upon your present screen, so long as it is necessary for you to show through it. The wetting can be best effected by means of a syringe with a rose top. After the screen is in position, an application now and again will keep it in good order. When using the cinematograph from the front, you cannot do better than get one of Field's faced screens (see his advertisement). This will give nearly double the brilliancy of any other screen on the market.

W.A.—If you intend using a larger disc you will obtain less illumination, but if the same size under the conditions you mention, the illumination will be practically the same as before, although the lantern will be further from the screen.

Lime.—Will the correspondent who sent us a letter signed "Lime," partly written with a typewriter, kindly send us his name and address in confidence, as we make it a rule not to insert letters unless this is done. As soon as we get this we shall have pleasure in inserting the letter, which speaks in high terms of the Lantern Society and the excellent work of its officers.

Butcher & Son.—The washer duly received; it answers admirably.

S. Kendon.—Illumination 1, saturator 2, blow-through 3; acetylene—safety 3, 1, 2, simplicity 3, 1, 2. The disc you suggest is rather large for acetylene. *Re* saturator—We have no particular choice. *Re* acetylene—Either Thorn & Hoddle, or the Acetylene Gas Company.

G. Bennett.—(1) If your wish had been carried out the parcel would have been liable for letterpost. (2) Acetylene will give a more brilliant disc than the oil lamp to which you allude, but the oil and the silvered screen would probably be ample for your purpose. (3) The wicks have a tip of asbestos, but we do not in the long run find them such a great advantage as you state.

Jex Bardwell.—We have incorporated a few of your remarks, but surely there must be some error about the material of the bellows of the English regulator, as the makers always use thick rubber and not leather.

T. C. Sheaff.—The "injector" with ordinary regulator. The "ejector" is practically a blow-through with the tubing carried a little further than usual beyond the oxygen nipple.

Two Correspondents.—You must keep a note of the questions yourself, and when we reply as 1, 2 or 3, we cannot look up old letters to send you your questions.

F. E. Fearnside.—Use separate gauges for oxygen and hydrogen unless you procure Clarkson's filled gauge, which can be used for both, as it is so constructed that the gas does not enter.

J. W. Wigmore.—Kindly note, for future information, that letters for the business and editorial departments should be written on separate paper. The cost would be about £75, and the weight a little under two tons. If you turn to our issue of April, 1894, page 83, you will find full particulars.

T. T. Wing.—Received just as we were going to press. In our next.

STILL THEY COME.

Mr. F. W. HUDLASS, of SOUTHPORT, when renewing his advertisement in the "Optical Magic Lantern Journal" writes, Oct. 17th, 1896.—"I am quite satisfied with my advertisement last month, I have had enquiries from all over England, Scotland, Ireland, France, Germany, &c."